DOCUMENT RESUME

ED 094 792 IR 001 009

TITLE	Project Operation Index: An Approach to Content Analysis and Indexing of Videotapes.
INSTITUTION	Ontario Educational Communications Authority, Toronto. Research and Planning Branch.
PUB DATE	Sep 74
NOTE	25p.
EDRS PRICE	MF-$0.75 HC-$1.85 PLUS POSTAGE
DESCRIPTORS	Computer Programs; Content Analysis; *Indexing; Information Retrieval; Information Storage; On Line Systems; Program Evaluation; *Video Tape Recordings
IDENTIFIERS	Canada; Project Operation Index

ABSTRACT

Three projects, each covering certain selected aspects of a potential information storage and retrieval system, were part of a study by the Ontario Educational Communications Authority (OECA) to explore various means for extending the usefulness of audiovisual materials. Project Dataset began the collection, classification, and cataloging of production and administrative data concerning each program within the OECA inventory; Project Operation Index began exploration of methods for in-depth content analysis of videotapes in close accord with specific teaching-learning requirements; and Project Access investigated the feasibility of an operational user-oriented on line computer information storage and retrieval system. The overall dimensions of the projects were examined and initial phases of data collection, experimentation, and testing were undertaken. This paper reports the work undertaken to date on the operation Index project. (JY)

ED 094792

The Ontario Educational
Communications Authority

Research and
Planning Branch

PROJECT OPERATION INDEX

An approach to content analysis
and indexing of videotapes

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September 1974

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EDUCATION & WELFARE
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INTRODUCTION

The Research and Planning Branch of The Ontario Educational Communications Authority in Canada in 1972 initiated a study exploring various means for extending the usefulness and enhancing the educational value of audio-visual materials owned by and/or available through the Authority. Account was taken of the potential use of videotape and film by individuals for study and learning purposes with concomitant requirements for detailed subject-matter indexes. Attention was given to problems related to the selection and identification of videotape information, from a current inventory of some 8,000 videotapes, for use within a teaching-learning context. The overall dimensions of a project for introducing, up-dating, and developing an information and access system designed to meet requirements of its most frequent users were examined and initial phases of data collection, experimentation and testing were undertaken.

Three projects were established, each covering certain selected aspects of a potential information storage and retrieval system. PROJECT DATASET began the collection, classification, and cataloguing of production and administrative data concerning each program within the inventory; PROJECT OPERATION INDEX began exploration of methods for in-depth content analysis of videotapes in close accord with specific teaching-learning requirements; and PROJECT ACCESS investigated the feasibility of an operational user-oriented on-line computer information storage and retrieval system.

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These projects were undertaken in addition to the daily operational activities of the Authority in respect to the provision of broadcast program guides, support materials, and a Videotape Programme Service Catalogue containing series and program titles; physical form, use, and access data; and brief program descriptions. Appropriate modification and expansion of existing services will be made in light of the results of these Research and Planning Branch projects.

This paper is a brief report of the work undertaken to date with the OPERATION INDEX project. The project has been completed in its developmental phase and requires additional testing before any final statements in respect to educational benefits or other advantages of the approach can be made.

PROJECT SCOPE

Objectives for OPERATION INDEX are to explore potential user requirements for information regarding videotape programs in whole or in part; to examine various approaches to indexing selected videotapes; to study potential uses of the results, and to report on recommendations for further action in the OECA. Not only is the subject matter content of the programs examined but an indexing process has been developed which also facilitates the identification and location of self-contained sequences within programs which could be of potential use in the learning situation.

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A basic premise of this research project is that a systematised method of organizing and describing televised material will facilitate the use of such materials in the teaching-learning process. If it is easier to pinpoint particular videotaped programs, or parts of programs, which deal with a specific topic it will be easier to promote their use.

Indexes which could be developed would serve (1) as a reference tool for individual study; (2) as an aid to selection of appropriate videotapes to correspond to expressed needs and interests; (3) as a catalogue of autonomous units from within videotapes for either class use or preliminary production research; and (4) as a resource guide enabling the inter-disciplinary usage demanded by many of the newer subjects such as environmental studies or Canadian studies.

INTERIM STATUS

Approximately 3,000 programs had been analysed as of October 15th, 1973. Of these, 850 programs were machine-sorted in a preliminary test. The examination of the three resulting listings resulted in an alteration in the indexing method to provide a stricter vocabulary control of the subject description. The code being used to describe the manner in which the subject was presented also required revision and expansion. As a result, over 2,000 of the programs were reviewed by March 31st, 1974. At this point, work began concerning another preliminary test using on-line access to 400 of the programs that had been reviewed. This test was completed as of August 31st, 1974 at which point it is hoped to begin implementation of a larger user-oriented information retrieval service using both batch and on-line facilities.

CONTENT ANALYSIS PROCEDURES

Videotape programs to be analysed are selected from current inventory lists for the In-school broadcasts section, and are assigned to content analysts, in accordance with subject area specialties whenever possible. Both OECA acquired as well as produced series are analysed. Descriptive and support materials are provided for each program for use by the content analysts prior to viewing.

Three Project Officers work as supervisors with the jobs allocated so that two supervise the completion of data sheets on the sequences selected by the content analysts and one supervises the completion of data sheets on the program as a whole. These three supervisors, all with masters degrees in the library and information science field, are responsible for ensuring accuracy in analysis and in the assignment of subject descriptions, vocabulary control and classification.

The content analysts, all students having completed undergraduate university degrees and some having Bachelors of Education as well, review program objectives, view the program up to three full times, and record subject and related information on data sheets. Approximately three half-hour programs are analysed by each content analyst. If sequences are selected from within the program, their location is recorded by means of the machine tape counter and their duration is noted using a stop-watch from the start of the program. Insertion of an electronic code for more accurate access to sequences is being explored. In addition, information about each sequence is given in terms of the format of the presentation, the difficulty level and related terms through which the sequence or program might be also accessed.

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SEQUENCE SELECTION

As has already been mentioned, in addition to the analysis and description of the videotape program as a whole. Small segments or sequences which can be used by itself apart from the program in which it occurs have also been selected. It is felt that the use of the OECA videotapes in the learning situation could be increased by enabling teachers and/or students to use only a portion of the videotaped program. This would mean that it would not be necessary to view an entire twenty or thirty minute program of which only seven minutes are specifically dealing with the topic under consideration. By providing a subject catalogue which includes sequence information as well as information about the program as a whole, videotape users could more easily tailor their use of videotapes to their specific needs.

SEQUENCE SELECTION CRITERIA

For purposes of the project, a sequence is defined generally as a related ordering of content elements which contribute to understanding in accord with selection criteria and which may by itself be considered as a viable learning experience.

In addition a sequence must have a minimum one-minute duration and should be primarily suited to television presentation in that the understanding transferred would be difficult to convey in any media lacking the combination of motion, sound, and picture.

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In order to establish consistent and relatively objective means for providing the most appropriate selection, a set of inter-disciplinary criteria and guidelines have been developed. The criteria limit the number of sequences selected, yet theoretically point out, by rule rather than by chance, specific sequences which relate to educational objectives commonly sought. The net result is a guide to major sequences within programs most likely to be of educational significance. The criteria serve as a mental checklist for the content analyst who blends personal judgment and experience in providing further information about program content.

The criteria are as follows:

01 Origination

02 Relationship, Interaction

03 Properties, Attributes and Characteristics

04 Process, Change

05 Outcomes

06 Contributions

07 Procedures

08 Terminology

09 Uses

10 Theories

11 Behaviours

12 Provocative Modules

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CRITERIA CATEGORIES 01 TO 04 limit selection to sequences which reveal some aspect of origination, process, change, relationship, or identify properties, attributes and characteristics in a meaningful way.

CATEGORIES 05 TO 09 bring forth sequences pertaining to understanding, awareness, or knowledge of contributions, outcomes, uses, techniques, methods, strategies, or terminology.

CATEGORY 10 points to significant sequences in which important theories or viewpoints in a field are expressed.

CATEGORY 11 isolates sequences within the affective domain dealing with aspects of behaviour, emotion, values, and attitude formation.

The remaining category is a flexible one which aids in the identification of those sequences which may be useful as case studies, self-contained illustrations of special interest, or as unique thought provokers.

When a program contains sequences which may be recorded by more than one method such that different recording methods lead to different time and sequence names, a set of guidelines for decision-making in sequence selection serves as an aid toward consistency and accuracy.

A handbook for indexers defines the criteria in more detail and explains its application.

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The same criteria are used by the content analysts to help them in verbalizing the subject content of the program as a whole. Once both the sequences have been selected and the subject matter of the program has been verbalized, it is necessary to formally describe the subject matter.

SUBJECT MATTER DESCRIPTION AND VOCABULARY CONTROL

The content analysts originally use the terminology of the program to describe the subject content of the program and any sequences which have been selected. Although the detail of the description is limited to 62 characters for the program description and 72 characters for the sequence description, there is sufficient space to allow the essential elements to be captured.

Once the subject content is provisionally formulated, the terms are verified by consultation with the Library of Congress Subject Heading (LCSH) List. If the terminology is the same as that in the LCSH List, the term or terms are added to the subject authority file and the term is checked off in LCSH. If, however, the terminology of the program is not in LCSH or, as in many cases, it is entered as an unused term, the terminology of the program would be favoured, the subject authority file consulted and the appropriate references would be made to include the new term in the subject authority file. This latter file, over a period of several months has become more of a thesaurus since it includes 'used for', 'related', 'broader' and 'narrower' term references. All the decisions concerning terminology were made by the supervisors who also assigned Dewey Decimal Classification

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numbers for the programs and sequences, if any. Until the preliminary test, the terminology had been uncontrolled with the result that the listings produced contained many synomous terms. It was as a result of this test that a more formal control mechanism was introduced.

PRESENTATION FORMAT DESCRIPTION

As a result of the innovative nature of the project, it was found that there were no existing tools which could be used to describe the physical format of the sequences selected and named. Obviously "videotape" was too general. The solution was to develop our own scheme of descriptors to describe the manner in which the subject matter of each sequence was conveyed to the viewer. A tentative scheme using existing terminology was employed for several months and it was as a result of its inadequacy that the present scheme was developed. After viewing over two thousand videotapes it became possible to devise categories which would adequately describe the physical methods utilized to convey subject content to a viewer of videotapes. The scheme is synthetic in that there are twenty-four categories which can be used alone or combined in pairs to describe the visual and auditory formats of the subject matter presentation. Some categories can be used either alone or with another category so as to provide a more extensive description, while some categories can only be used in combination with other categories. These latter categories are specifically auditory effects which, because of the nature of television as a medium, would only in very rare cases be used alone with no accompanying visuals. The new scheme has been in use

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for over a month and has been very successfully utilized by the content analysts. This scheme is useful not only as a means of describing the physical format of the information presented by the videotape but also serves to amplify the subject descriptions themselves by putting the subject content into a physical context.

For the program as a whole, a more general scheme was developed by the Project Dataset team and adopted by Operation Index. This scheme involves the use of ten categories since often the program as a whole would use three or four different presentation techniques in presenting its subject matter, which taken together, would be a general method such as lecture, documentary or demonstration.

DIFFICULTY WEIGHTING

A four-point scale of concreteness-abstractness adopted from Trenamen[1] was chosen to assess the difficulty level of sequences selected from the videotape.

The following classifications are used to rate the level of difficulty of the sequences.

LEVEL OF DIFFICULTY	CHARACTERISTICS
01 LOW	Things, events, processes (primary) that can be directly perceived through one or other of the senses, with generalization (secondary) confined to descriptive categories; e.g. pointing out certain characteristics of a concrete object, such as a fossil.

[1] Trenamen, J.H. , Communication & Comprehension (Plymouth: Bowering Press, 1967)

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LEVEL OF DIFFICULTY		CHARACTERISTICS
02	MEDIUM-LOW	Things, events, processes (primary) that can be directly perceived through one or other of the senses, but with simple generalizations (secondary) about qualities, relationships, principles, and classes of objects directly related to what is perceived; e.g. explaining the process of fossilization.
03	MEDIUM-HIGH	General concepts or ideas (primary) illustrated by sequences of perceived and familiar objects; e.g. distinguishing the given fossil from other fossils and explaining its evolution as a species by showing examples of related fossils.
04	HIGH	General concepts or ideas (primary) unrelated to perceived objects; e.g. from several arguments arriving at a description of evolution in general.

TESTS

Two tests have been carried out, and one is proposed, to examine the validity of the assumptions underlying the project and to test the usefulness of the data collection methodology.

a. Information Retrieval Simulation Test

In August 1973, 850 of the analysed programs, including 2,200 sequences, were keypunched and machine-sorted to produce three listings: a keyword report, a Dewey report and a Basic Production Number (BPN) list.

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The keyword report for the 850 programs was produced and edited with only very obvious spelling and keypunching errors corrected. The resulting report showed that the terminology would have to be more strictly controlled so as to produce consistency in the keywords and to eliminate synonyms. Also cross-references to related terms and from unused terms had to be given a more formal structure. In the meantime, the keyword report, even in its comparatively primitive form, was of use to provide subject access to that part of the OECA videotape collection represented by the 850 programs. The keyword report has continued to be used in a limited manner to answer in-house and, occasionally, external queries about videotapes. In particular, the Videotape Librarian has found that, although the vocabulary is in a relatively uncontrolled form, the KWOC (Keyword Out of Context) format can still provide subject access to OECA videotapes which otherwise could only be accessed using the series title, program title or the Basic Production Number (BPN).

The Dewey report is a grouping of the test programs and sequences by Dewey Decimal classification number. The main use of this report is to show the subject coverage by a broad subject grouping of the programs in the collection. No reliable information can be provided by the test report except that it shows the subject areas of the content analysts to be in the social sciences, particularly education, the applied sciences, and the arts. The education bias would probably indicate the subject bias of the collection as a whole.

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This information concerning the subject coverage of the collection will be useful for future planning of programs, and in relation to user studies would further help relate the collection to the interests of its users.

The BPN (Basic Production Number) Report is a listing of the program and sequence subject headings resulting from the content analysis of each program. Additional information is also provided: the Dewey Decimal Classification number for sequences and programs; and the starting time and duration for each sequence selected. The report augments the information provided by an existing Program Inventory Listing also organized by BPN. The two lists, when used in combination, give extensive information concerning both the program as a whole as well as its more specific subject content as illustrated by the sequence subject headings.

The most important contribution of this first test was that it showed the necessity of a more controlled vocabulary mechanism and the lack of consistency which sometimes occurred when there were more than six content analysts per supervisor.

b. Subject Access to Videotapes (SAVIT) Prototype Service

From June to September 1974, a prototype on-line computer access service was set up with a threefold purpose:

1. to demonstrate, within the context of OECA, the feasibility of a subject information retrieval service for videotapes;
2. to demonstrate the use of interactive conversational computer facilities; and
3. to assess user response and service needs.

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The first task was to implement those operations necessary for demonstration purposes. Subject information about OECA videotape programs and parts of program was available as a result of Operation Index. This information was put into the computer and subject access to series, programs and parts of programs was provided. The service was then made available to OECA Staff and outside users for demonstration purposes during which time information was collected for the evaluation of the feasibility and acceptability of the service.

As the data base for the SAVITS prototype service, a sample of four hundred videotapes from the OECA collection was selected from those subjects indexed by Operation Index. The subject content of the sample collection was selected according to OECA's Educational Media Division (EMD) guidelines. In March of 1974, the EMD produced a rationale[1] for project activities in which it outlined the major thrusts within the area of school curriculum. Two of the major thrust areas emphasized are:

a. social and environmental studies

b. pure and applied sciences

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[1] A Rationale for E.M.D. Programming and Project Activity, 1974-1977 March 1974

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As a result of the size limitations imposed by the computer program being used, these two areas were further subdivided, in the manner detailed by the E.M.D.[1], to produce these four critical mass areas:

a. social sciences

b. environmental sciences

c. sciences

d. mathematics

For each program, the information selected for entry was:

basic production number

series title

program subject heading

sequence subject heading(s), when present

presentation(s), when sequences are present

keywords including subject term(s), presentation format(s) and series title.

Access to the information was by keywords only, although, as can be seen above, the keyword string includes access by series title and presentation format as well as by subject content terms.

In order to provide on-line computer access to the subject information, OECA contracted with the University of Toronto to obtain use of an interactive retrieval program developed at the Faculty of Library Science (FLS). This program could, with a minimum investment of time and money, provide an opportunity for staff at OECA to familiarize

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[1] Rationale for E.M.D., chart following p.20

themselves with an operating example of an on-line subject access service for OECA videotapes. The FLS program could provide interactive access to a data base through a subject or "keyword" list. It can be adapted to provide output in the form of cards, printed copy or, visually, on a cathode ray tube (CRT) terminal. The computer program is written in APL (A Programming Language) which can be used on large computer configurations such as Xerox and IBM as well as micro-mini cassette-memory programmable desk calculators.

In order to evaluate the success of the demonstrations and the acceptability of the service, certain operations were demonstrated and then reactions were recorded by various means. The service was extended to those staff of OECA who might want access to subject information about OECA videotapes.

As well as these in-house users, the service was available for use by members of the teaching profession and people involved in selection or acquisition of media for schools, school boards or libraries. Suggestions were made as to the possible uses which can be made of the service, such as:

- the selection and acquisition of videotape programs or series
- the compilation of lesson plans or class projects involving the use of videotape materials; for example, by compiling topic or age specific learning packages
- the answering of requests for subject information about specific programs and/or series
- the answering of requests for information about what programs and/or series are available on specific subjects.

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The components of the service were explained so that the users knew what information was accessible and how access could be achieved. The actual manner of using an on-line computer service was demonstrated to each participant and the opportunity for individual interaction using the terminals was provided. While participants in the demonstrations were using the service themselves a record was kept of their manner of use of the service visa vis the questions asked, the interaction between the user and the hardware equipment and their satisfaction with the output produced.

The evaluation of the demonstration was carried out using the information gathered during the use of the service. The evaluation provided the means of assessing the success of the service in the three areas of subject access to videotapes, on-line computer retrieval and acceptability to OECA staff. The method of gathering information was project diaries kept by each of the three project officers. These diaries contained a record of the activities undertaken, decisions made and problems encountered during the implementation and demonstration of the SAVITS prototype service. Also, observations and informal reactions of the users were recorded. The project diaries also provided information which can be used as a ground work for future decisions and recommendations concerning computer facilities for OECA.

The demonstration records provided the following information:

A. <u>Regarding orientation and demonstration effectiveness</u>

1) The orientation gave most of the users a basic understanding of what information is available through the system and how it is accessible. Often it was not until the actual demonstration was under way that the information produced in the introduction could be really comprehended.

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2) The possibility of adding or adapting new information was accepted almost too easily by the users. This could very possibly be a result of the misconception that the SAVIT Prototype Service was a finished product and not just one step in an experimental process.

3) There was a general understanding of the principles of computer terminals and on-line systems. Again, the lack of inquiry about the terminal and on-line systems could be more a result of a lack of experience than a lack of interest. There were several inquiries about where the computer was but on the whole there was a reluctance to inquire about technical matters.

B. Regarding user reaction to interaction with the computer

In general, the users divided into two groups, those who wanted the system demonstrated to them and those who wanted to use the system. Only one user was definitely afraid of the terminal typewriter. Most of the people who were external users were not interested in using the terminal.

1) Those who did use the terminal themselves had problems only in so far as they were capable or not so very capable typists. Once they understood the basic method of responding to the computer's questions or commands and pressing the carriage return key to indicate the end of statement the main problem was in finding the correct letters.

2) The machines were generally acceptable. The 2741 IBM typewriter terminal was used more often than the Vucom, mainly as a result of first, the difficulties encountered in "signing on" with the latter, and second, the situation of the Vucom in the basement, five floors away from the Research and Planning Offices. The 2741 terminal was familiar to most users as a result of its similarity to the IBM Selectric typewriters in use in the Authority. There were complaints, however, about its noise level, particularly when displaying retrieval items.

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3) There was an obvious trend apparent in the likes and dislikes of machine use, regardless of which machine was being used.

a) In the area of the user asking or answering questions

i) the clarity of what was meant by the "control" words and how they should be used was definitely not adequate. Both the "keywords" and "retrieve" control words were not properly understood from the explanation provided by the program. Also, the explanation added to the "and/or" request did not provide an adequate understanding of how they widened the search. Finally, the display process was on occasion not very well understood by the users so that the retrieval was not as successful or useful as it might have been. The Research and Planning staff were of definite use when the user was trying to develop some sort of search strategy, especially since each search was autonomous and the logic wouldn't be built up through successive searches.

There was also considerable complaint about the lack of direct movement from one function to another and from one file to another. It was felt the control words were too reiterative in that one had to follow exactly the same route regardless of whether it was the first attempt or the fifth. This meant that the user who had become familiar with the system would get very irritated. The third area of complaint with the control words in particular and the program in general, was the dry, humourless character of the language. It was generally felt, by both experienced and inexperienced users, that there was not enough of an attempt to utilize the conversational possibilities inherent in an on-line information retrieval system.

ii) As has already been mentioned, the typing was not so much of a problem but there were related problems which did produce comment. First, the computer program was too literal in its structure so that it had no tolerance for spelling errors, especially in the control word area. Also, it insisted on exactly the same word as it appears in keyword list so that "centre" could not be accessed by "center" or "centres". As might be expected, it was only those who skipped the keyword listing function who encountered this problem but nevertheless it is a shortcoming. Somewhat related to this is the lack of allowance for conducting searches on truncated terms, e.g. "agricult" which would access all keywords with this root. The obvious extension is the number of complaints about the lack of a machine-stored dictionary or thesaurus to lead the user from unused to used terms, and from requested

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terms to related terms. The lack of flexibility in the area of typing mistakes has led to some users having the file tied by the computers because they typed a control word incorrectly. This would seem to discourage the use of the SAVIT prototype service independent of the Research and Planning staff.

iii) All the above mentioned problems were involved in increasing the frustration of the users when they made mistakes in typing or interpreting control words. If there hadn't been a Research and Planning staff member present to resolve problems the frustration could easily have been seriously detrimental to the success of the SAVIT experiment.

b) In the area of the replies on the part of the computer, there was less complaint.

i) The speed was on most occasions very good but this in itself can be a problem. As a result of the generally small wait period usually experienced, the expectations of the users were increased so that a very slight delay was found irritating whereas the same amount of delay using the manual system would be easily overlooked. This reaction is a common one with most on-line retrieval system users, whether they have five minutes or five years of experience.

ii) The display format unfortunately came in for a lot of complaint. This was more a result, a certain degree, of incompatibility between the sequence data and the Faculty of Library Science display mechanism. It resulted in a somewhat cluttered format which was hard to read, particularly when using the Vucom since the data eventually disappeared off the top of the screen and had to be scanned fairly quickly.

There were some other problems with the output mainly, as was already mentioned with the Vucom cathode ray tube (CRT) terminal. The Vucom displayed at a fast speed and, in either the page or scroll mode, the data did not remain for very long. There were several requests to have it stopped so that the data could be read at a more leisurely pace and also requests for printed copy. The other problem was that if a search or retrieval proved to be useful it was very difficult to exit without typing up the files.

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C. Regarding users' reactions to the information provided

1) In regard to users' reactions to the information provided, the basic reaction was more data, both in the sense of more programs and more data about programs. Internal OECA staff either had need for the information and/or could see its usefulness. The participants external to OECA could either see clearly its potential or in some cases, particularly with those users in the education field, had need for the information.

2) Almost all the internal users and some of the external users mentioned the need for inclusion of information concerning:

audience level or target audience,

copyright information like expiry date and rights cleared,

program length in terms of time,

colour or black and white.

3) The presentation of the information was adequate but there were some complaints

a) the accuracy is generally high although some spelling mistakes have appeared in the main body of the record. This is bound to happen when there is no proof-reader on a regular basis. There were spot-checks carried out, specifically on the keywords.

b) As mentioned earlier, the sequence data was sometimes cluttered in display which made it harder to comprehend. There was a few complaints about the fact that a keyword could point to sequences and/or programs as a whole and it was suggested that either the sequences should be displayed as separate items or not at all.

c) Again, the vocabulary would be more useful if there was a cross-referencing capability.

d) It was generally considered that the stored data would be more comprehensive if, first more programs were included and second, if the data were stored in one big file to provide interdisciplinary search and retrieval capability.

e) As has already been mentioned, the clarity of the display was rendered less effective by the sequence field and by the lack of adequate explanation concerning the display process.

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D. Regarding need for the service

The in-house participants in the prototype service could all see a need for subject-accessed information either in their own work or in the Authority. It is hard to tell, however, whether or not it is a case of preaching to the converted since they would not have come to see the system unless they were already interested. The videotape librarian used one terminal, the CRT, in his every day work and is probably the most adamant in expressing need for subject access to videotapes. Most of the participants saw a need to have considerably more data entered into the system as well as more information concerning each program such as:

* - audience level or target audience
* - expiry date
* - program length
- program description
- colour
- talent
- production team
- source
- support materials

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* most often mentioned

The main additional suggestions for improvement are:

i) make a program that integrates all the information into one file with a more flexible method of query and entry and exit.

ii) make the language of the interaction more conversational and chatty.

iii) if the CRT was to be used in pilot system, provide some sort of print facility.

iv) change display method for records to make them easier to read.

v) provide cross-referencing facility.

All the users were in favour of having the service operationalized as soon as possible. Some external users who had definite need of the service were somewhat irritated by what they felt were unnecessary preliminaries like prototypes and pilots. The only cautionary comments dealt with the necessity of having the operational system compatible with existing systems, both in-house and external.

As can be seen by this report, most of the problems encountered in the SAVIT prototype service were due to the computer program. This is to be expected when renting a program designed for use with data considerably different in format. On the whole, however, the immediate need to demonstrate subject access and on-line computer services was met by the program.

In addition to familiarizing OECA staff with the direction the Operation Index project was going, the SAVIT prototype service provided those involved with Operation Index with a more concrete idea of exactly what type of service should be offered by a more extensive project.

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E. Proposed pilot study

The last phase of development is a pilot study which would provide subject access, in an on-line mode, to all the programs in the School and Youth section of the inventory of available programs. The subject access service would then be offered to selected groups of the general public over the period of at least one school year. Not only would the on-line access be offered but also special listings such as subject listings could be provided using batch processing. General questions to be addressed by the pilot project are:

1. To what extent does the data generated to date help to meet teaching-learning needs of target audiences?
2. How can the information provided be improved to more closely meet user needs?
3. How appropriate is the retrieval tool for meeting user needs? (Cost-benefit analysis)
4. What considerations should be taken in to account prior to activation of a fully operational system?

It is hoped on the part of the people involved in the Operation Index project that this pilot study will soon be implemented.